Kansas City SCOUT

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E. Jason Sims P.E.

Managing Mobility in Kansas City

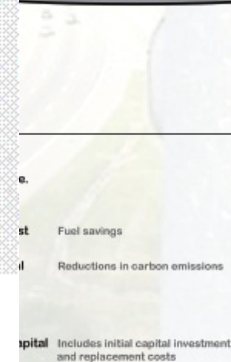*getting you there*

Partners

What is Kansas City Scout?

- Freeway Management System
  - Safer Highways
  - Improved Traffic Flow
  - Improved Emergency Response
  - Hub of transportation for two states.

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Why Scout?

- The cost of an additional lane of pavement is around $1,500,000 per mile.

- The average cost of additions to the Scout System is $280,000 per mile.

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Why Scout?

- Incident Management Coordination
- Traveler Information
- Wealth of Data
- Innovative Traffic Management Solutions

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The Kansas City S[...]

Kansas City Scout is Kansas City's bistate traffic managem[...] tem. It is a result of partnership between the Kansas Dep[...] of Transportation (KDOT), Missouri Department of Transp[...] (MoDOT), Mid-America Regional Council, and the [...] Highway Administration (FHWA). These partners designe[...] to lessen traffic jams by improving rush-hour speeds, to i[...] safety by decreasing the number of rush-hour crashes, [...] improve emergency response to traffic situations.

The Impact of the KC Scout

As Kansas City's driving population grows, traffic issues [...] congestion, crashes, and air pollution become even mor[...] lent. Inadequate funding and, in some cases, inadequa[...] to widen roadways have made new construction and lan[...] tions an increasingly difficult solution. Still, the need fo[...] and efficient system for freeway travelers continues. I[...] states, technology and traffic management have beco[...] answer to these problems. For Kansas City, the answer is [...]

Launched in 2004, Scout manages traffic on more than 10[...] of continuous freeways in the greater Kansas City metro[...] area. Scout uses cameras to monitor the highways from i[...] management center in Lee's Summit. The system relies on [...] to gauge traffic flow and to generate real-time accurat[...] times, and uses large electronic message boards to sen[...] traffic notices to drivers along the freeways. Scout also u[...] Highway Advisory Radio system on 1690 AM that mot[...] Missouri can tune to in the event of a freeway incident. [...] bistate incident management program uses Motorist Ass[...] Emergency Response patrols to help clear roadways, redu[...] gestion, and aid injured or stranded travelers. Ad[...] congestion management tools include a pilot corridor [...] metering and the interstate to arterial program partnershi[...] MARC's Operation GreenLight (marc.org). There also is [...] of recent innovative technological enhancements such as [...] redesigned interactive web site (kcscout.net), "My KC [...] personalized web alerts, regional video distributi[...] jam cell cams.

Summary of Kansas City SCOUT Annual Program Benefits vs. Costs

Benefit to Cost Ratio = 8.1 → For every $1 spent on the KC SCOUT program, transportation system users and system management agencies see approximately $8 in benefits.

Benefits
Total Benefits = $51,883,000

Travel Time $41.0 M
Operating Cost $6.6 M
Environmental $2.8 M
Crash Reduction $1.5 M

Costs
Total Costs = $6,404,000

O & M $3.4 M
Capital $2.9 M

KEY

○ Each circle represents $1M in value.

Benefits

● Travel Time — Time saved by drivers due to reduced congestion

● Crash Reduction — Elevated safety levels reduce secondary crashes

● Operating Cost — Fuel savings

● Environmental — Reductions in carbon emissions

Costs

● Annual O & M — Costs to operate and maintain

● Annualized Capital — Includes initial capital investment and replacement costs

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KANSAS CITY'S TRAFFIC MANAGEMENT SYSTEM

[...]atio.

[...]8 in ben-
[...]ncies. These
[...]gs in fuel and other
[...]age Signs are essential in
[...]he information that is dissemi-
[...]management has become a regional
[...]tion of incidents lasting over 90 minutes,
[...]me. Motorist Assist plays a key role in the suc-
[...]ectively, these three major components of the KC
[...]costs to build and maintain the program.

gram Benefits vs. Costs

[...]ram, transportation system users
[...]approximately $8 in benefits.

Costs
Annual Costs = $6,404,000

O & M $3.4 M
Capital $2.9 M

[...]st — Fuel savings

[...]l — Reductions in carbon emissions

[...]apital — Includes initial capital investment and replacement costs

- Level 3 incident time reduction
- Total incident time 47min-21min in 5 years.
- 18-22% increase in highway capacity
- Incident Time in Ramp Metering corridor 22min-16min
- More efficient dispatching and routing of emergency vehicles
- Coordination with arterial corridor signals and interstate information

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A New Approach to Mobility

- Measure Performance
- Evaluate Performance
- Develop Plan
- Implement Plan
- Integrate information back into Planning Process

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Useful Reports

Scout Monthly and Yearly Report

Congestion/Mobility Report

Benefit/Cost Report

ITS Benefits Report

Ramp Metering Evaluation Report

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– Vehicle Detection Stations (VDS)

– Closed Circuit Television Cameras (CCTV)

– Dynamic Message Boards (DMS)

– Highway Advisory Radio (HAR)

– ATMS Expert System

Vehicle Detection Stations

Traffic Sensors (Vehicle Detection Stations/VDS Loops)
(Detects Traffic Volumes – Not Individual Vehicle Speeds)

Remote Traffic Microwave Sensors/ RTMS

Traffic Sensors (Remote Traffic Microwave Sensors/RTMS)
(Detects Traffic Volumes – Not Individual Vehicle Speeds)
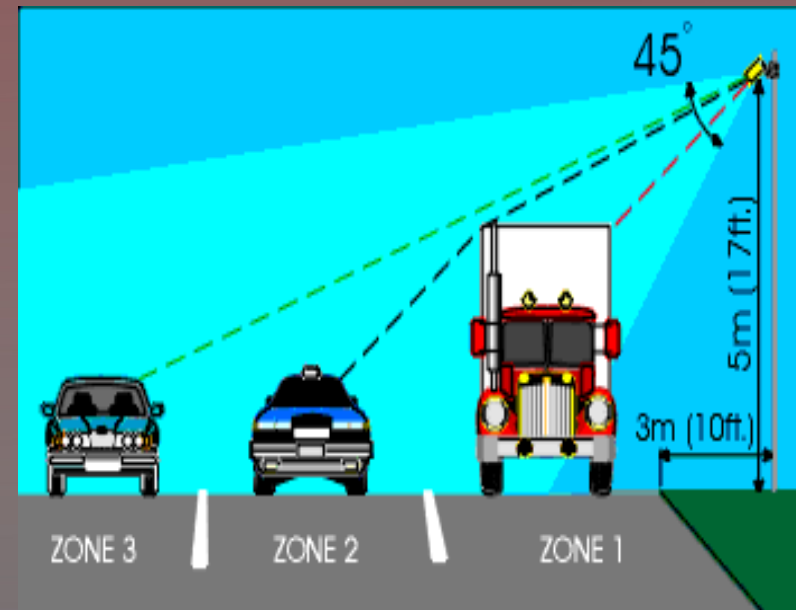
CCTV Cameras

Camera (CCTV)
(No Video-taping/No Law Enforcement)

Dynamic Message Signs

Electronic Message Sign (DMS/CMS)

(For Urgent Traffic Messages Only)

Scout Travel Times

Travel Times: Your "Heads Up" on the Road
When you drive a workweek commute you know the traffic

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I-435              4 MIN
DOWNTOWN          11 MIN
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Segments

A Segment is a length of roadway
bounded by two consecutive Vehicle Detection Stations

VDS_1

VDS_2

D
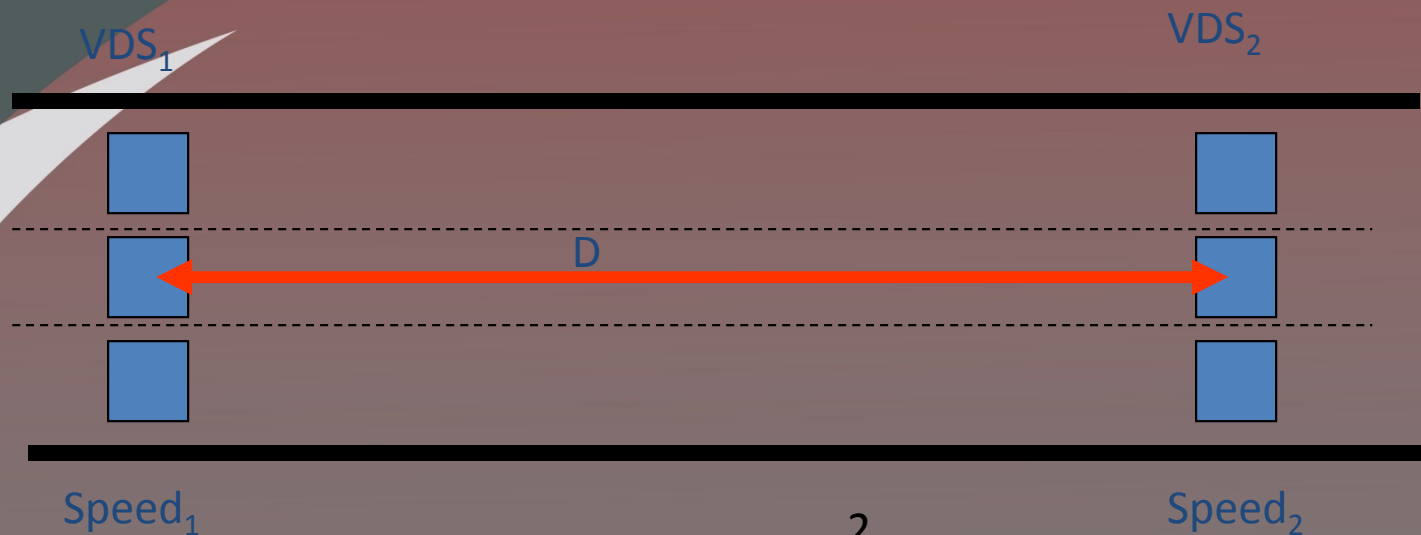
Speed_1

Speed_2

$$\text{Segment Speed} = \frac{2}{\frac{1}{\text{Speed}_1} + \frac{1}{\text{Speed}_2}}$$

$$\text{Segment Travel Time} = \frac{D}{\text{Segment Speed}}$$

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Sections

A Section is the set of contiguous Segments that represents the roadway from a DMS to a Target
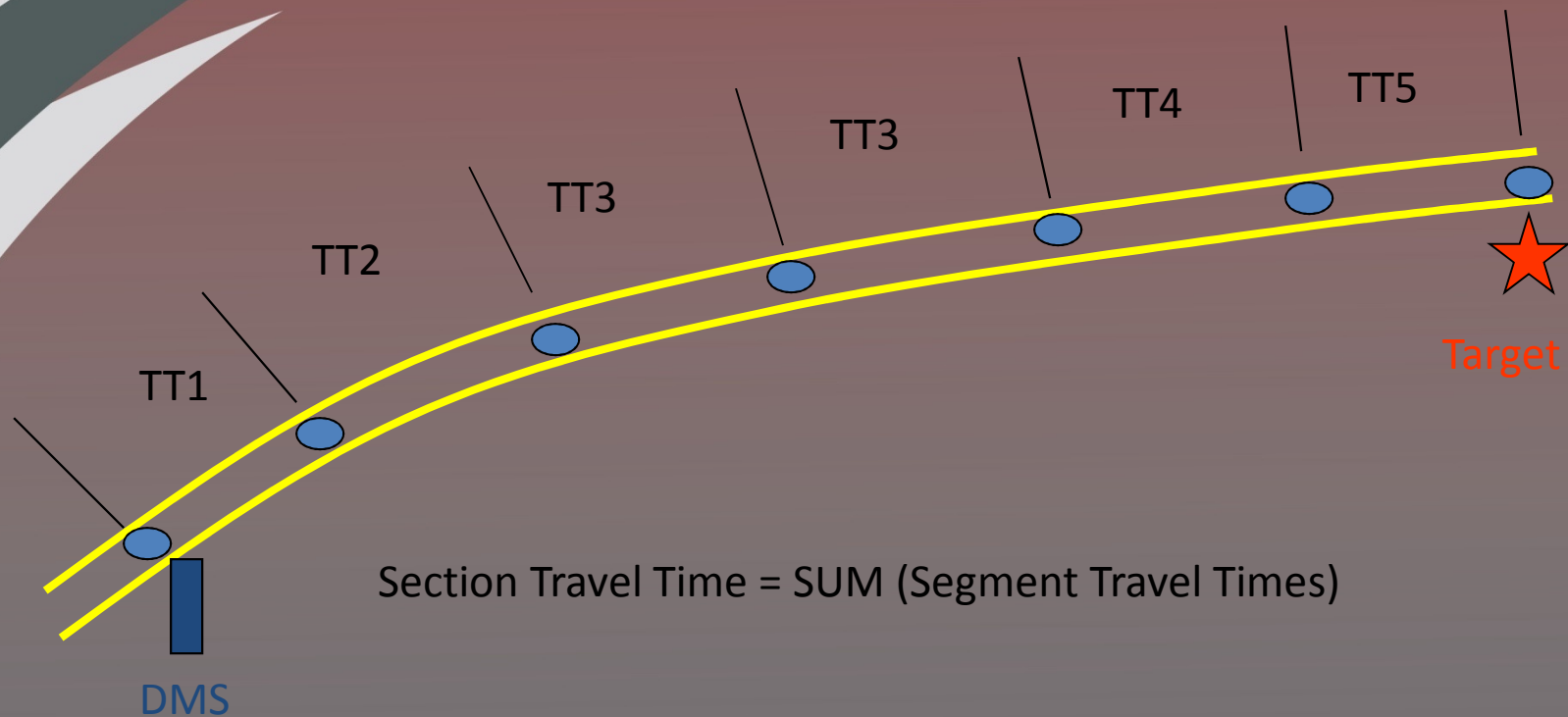
TT5

TT4

TT3

TT3

TT2

TT1

Target

Section Travel Time = SUM (Segment Travel Times)

DMS

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Highway Advisory Radio

Motorist Assist & Emergency Response

Missouri (MoDOT)
- 21 Operators
- 12 Vehicles
- 105 Mile Coverage

Kansas (KHP)
- 8 Operators
- 4 Vehicles
- 123 Mile Coverage

Day and Evening Shift Coverage

Mobile Applications

www.kcscout.net

Twitter @kansascityscout

MY KCScout web alerts
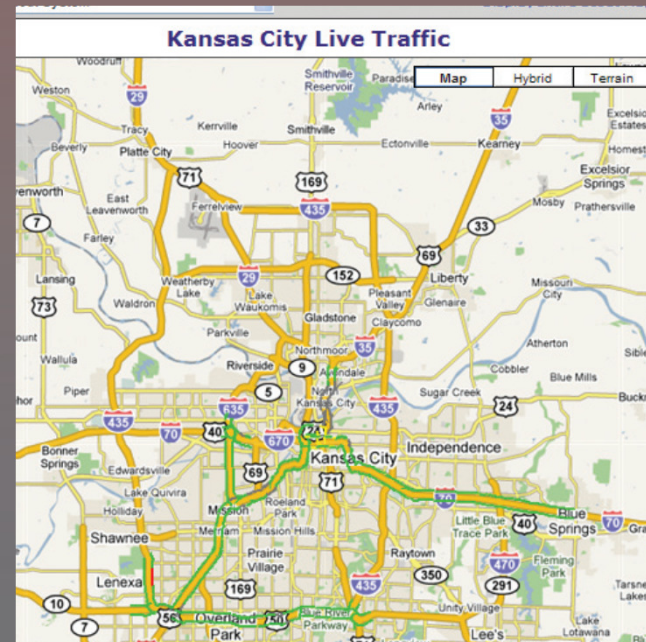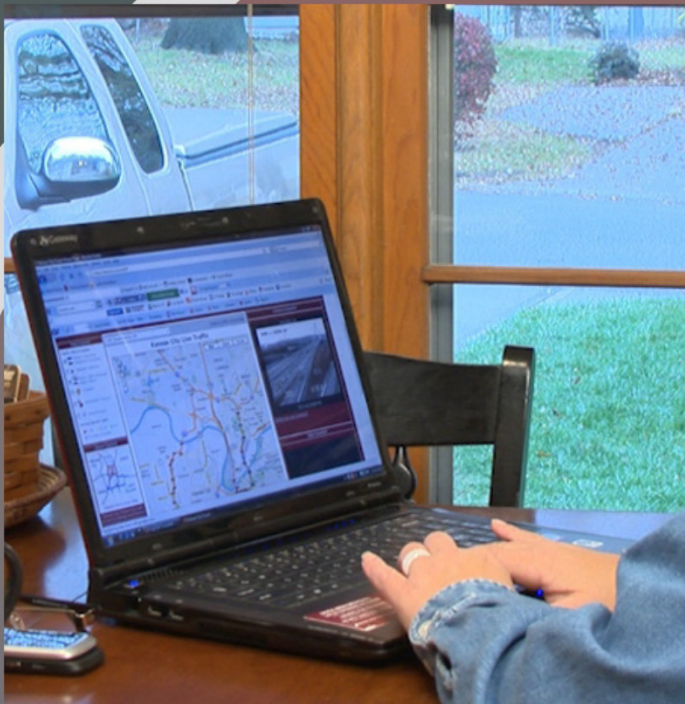
Project Map
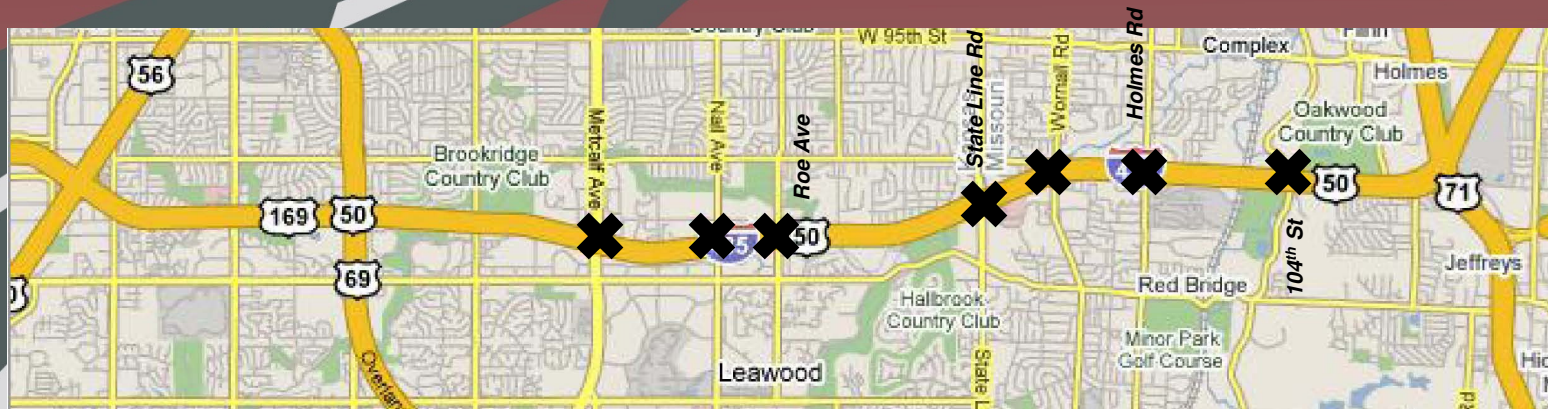
✖ *Ramp Meter Location*

Ramp Metering

- The meters will add to KC Scout's existing transportation management system, which is designed to:
  - Lessen traffic jams by improving rush hour speeds.
  - Increase safety by decreasing the number of rush hour accidents.
  - Improve emergency response and accident clearance times.

KC Scout's existing system is shown in black.

- Depending on the location, ramp meters on I-435 will have one or two lanes. Both scenarios permit one vehicle to proceed per green light per lane.
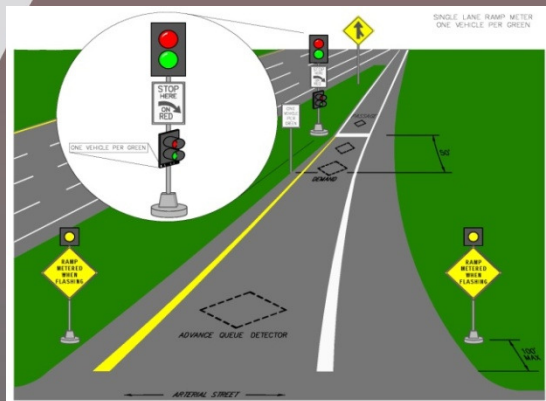
Single Lane, One Vehicle per Green
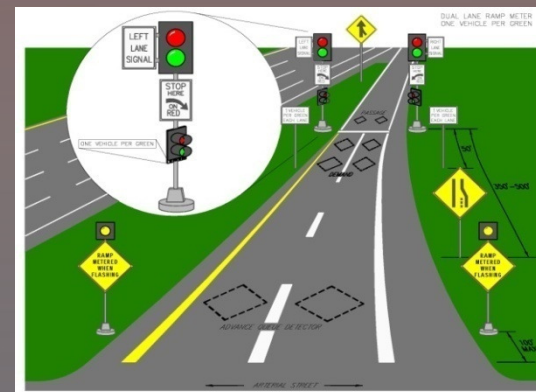
Dual Lane, One Vehicle per Green

Law Enforcement
Tattle-Tale Enforcer
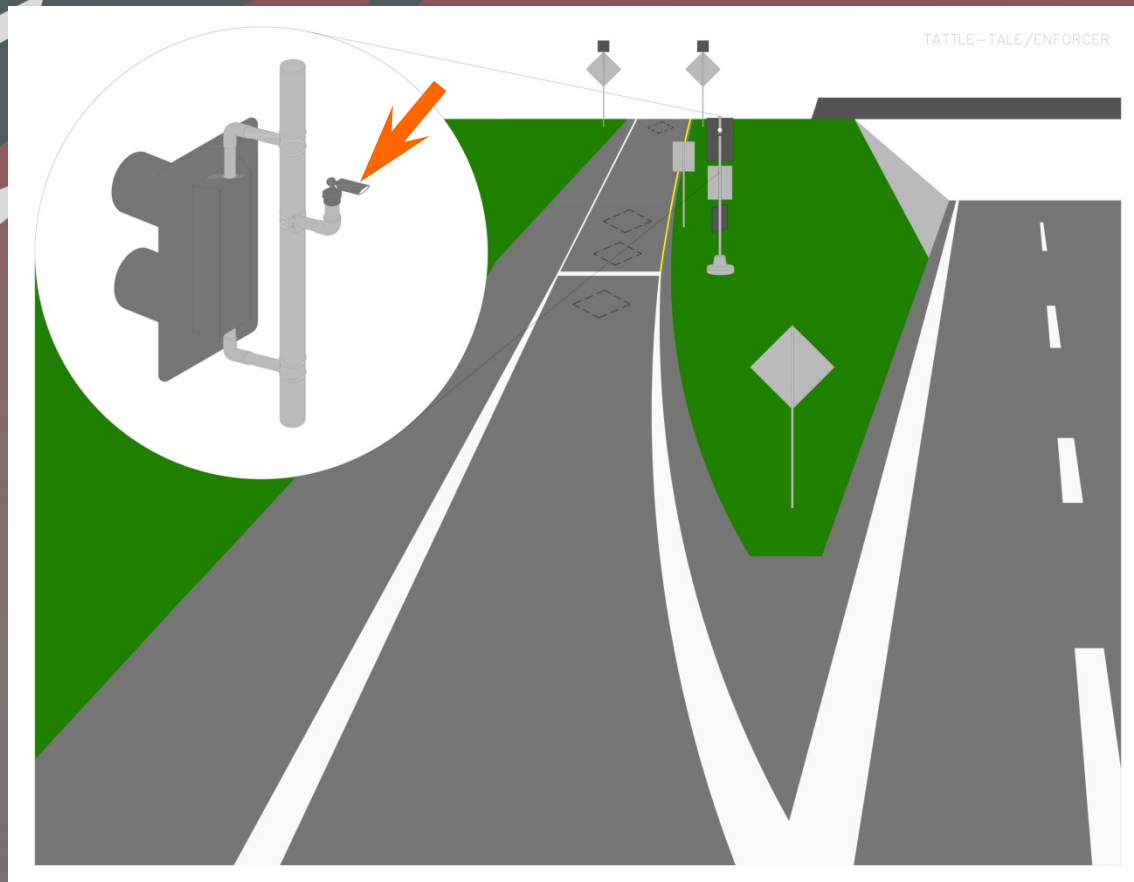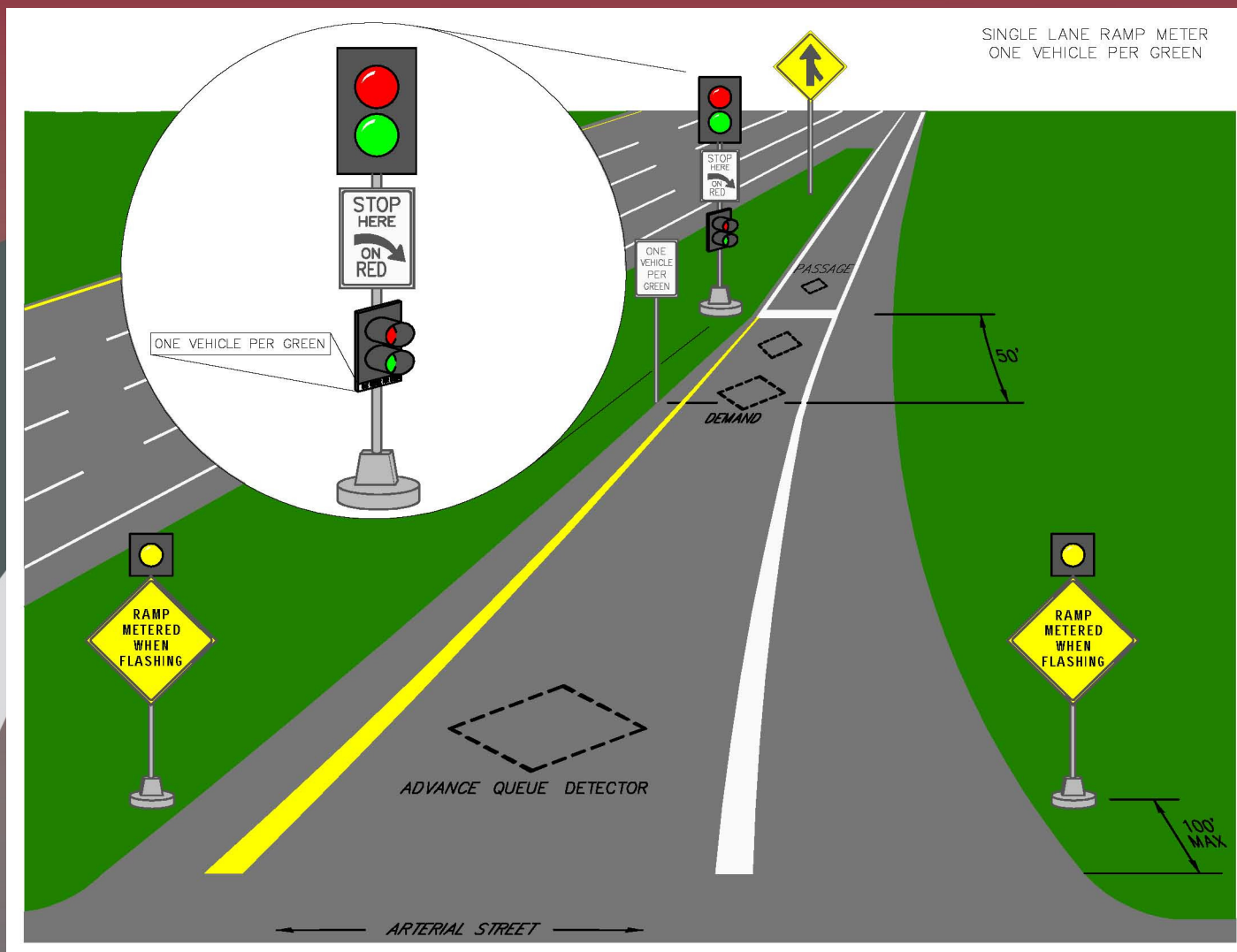
Single Lane Ramp Meter, One Vehicle per green light. Westbound Wornall Road and eastbound 104th Street are possible locations.
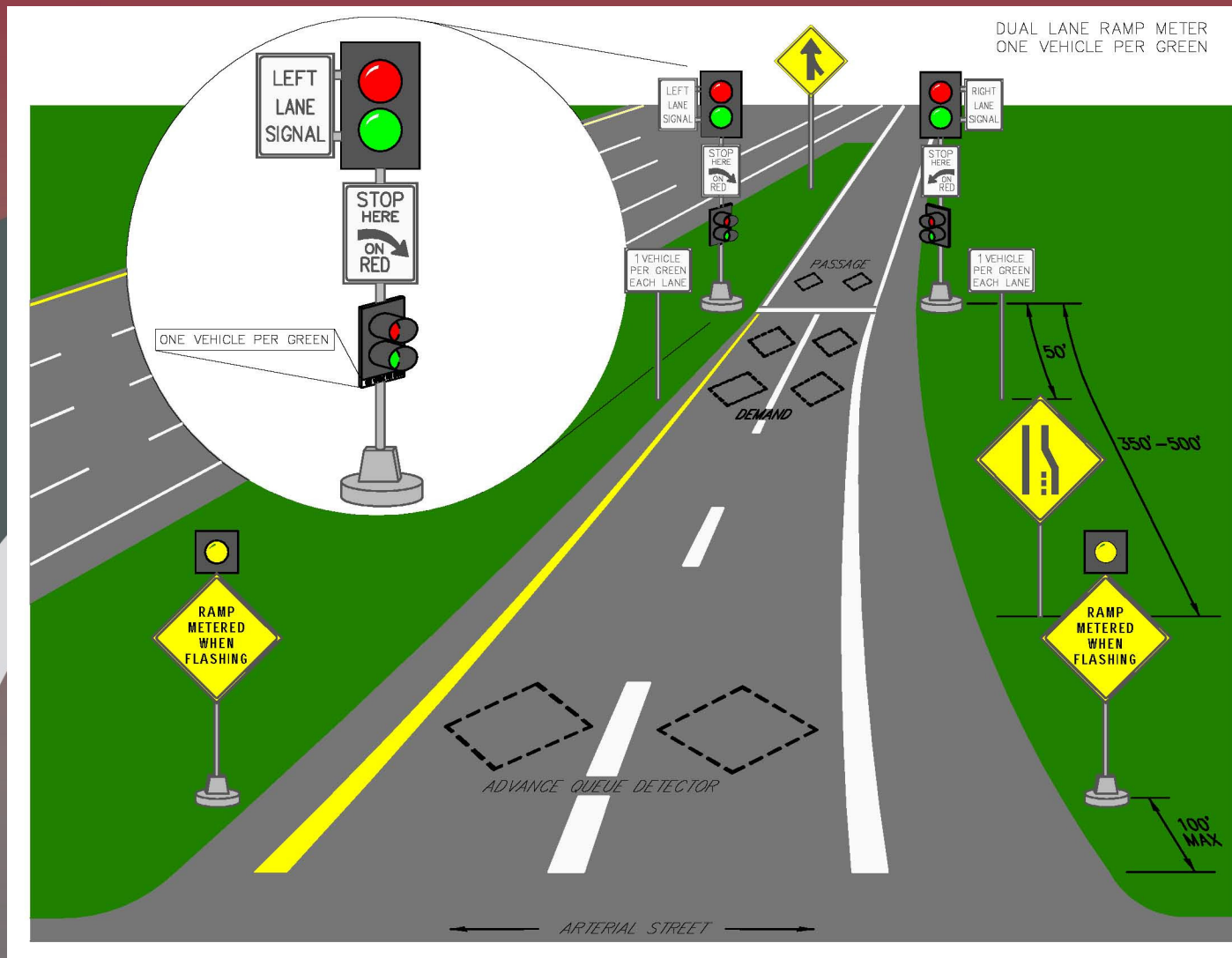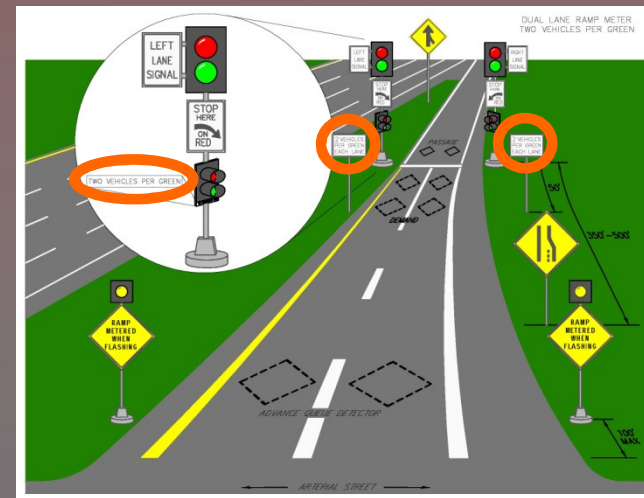
Dual-Lane Ramp Meter, alternating One Vehicle per green light per lane. Westbound State Line Road is a potential location.

- Some locations will allow <u>two</u> vehicles per green light. **Signs** will indicate the number of cars permitted per green.
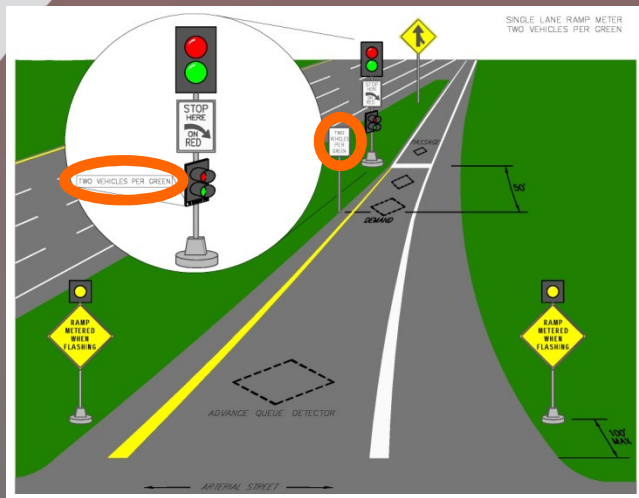
Single-Lane, Two Vehicles per Green

Dual-Lane, Two Vehicles per Green

Public Relations Campaign

- The goal is to…
  - Raise awareness, educate, and change driving expectations
- We can reach our goal by…
  - Using a core set of presentation materials to share the right level of information with the right audiences

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Reach Targeted Audiences

Audience	Thematic Outreach Materials
Technical staff and local officials	Technical content with emphasis on facts, benefits, and experiences of other communities
Local public officials	Less technical content with accent on ramp metering benefits and safety
Law enforcement (highway patrol)	Focuses on ramp metering operation and enforcement
General public	Highly graphic, non-technical, and focuses on the need for ramp metering

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www.kcscout.net/rampmetering

Increased Volume with consistent travel time

Significant Reduction of side swipe and rear end accidents

Incident Times reduced

Public acceptance high

Law enforcement and Court support

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- Questions?